tion to the plates (which were rolled hot) experimented upon in Table VIII, it will be noticed that, in several instances with soft cast steel and hard cast steel, the wrought iron did not assume the electro-positive position until two or three hours after immersion in the nitric acid. Subsequently the iron assumed its normal position, and became during the long remaining period of the observations electro-positive to the steels, with a considerable and increasing E.M.F., showing that the wrought iron was becoming gradually very much less passive than the steels. In the case of the soft Bessemer and soft Siemens plates, Table VIII, we have also a similar instance of these peculiar and temporary interchanges and variations of relative passivity which are not easily accounted for. In the case of the tungsten steel, Table VI, the wrought iron was steadily in the electro-negative position, hence in the latter instance showing the wrought iron to be permanently more passive than the tungsten steel.

A reference to the experiments on the wrought iron and various steel plates, on Table VIII, shows that the E.M.F. between the passive wrought iron and the various soft steels, which contained less percentage of combined carbon, in circuit in cold nitric acid sp. gr. 1·42, was very considerably less than the E.M.F. under similar conditions between the wrought-iron plates and the different hard steels having a higher percentage of combined carbon. The latter results, therefore, demonstrate the interesting circumstance that steels, of a higher percentage of combined carbon are more passive than those of a lower percentage of combined carbon. It will be observed that the wrought iron was also electro-positive to most of the steels, whether of a higher or lower percentage of combined carbon, which shows that wrought iron may be regarded as generally less passive than steels.

III. "On the Demonstration of the Presence of Iron in Chromatin by Micro-chemical Methods." By A. B. MACALLUM, M.B., Ph.D. Communicated by Professor H. N. MARTIN, F.R.S. Received April 23, 1891.

(Abstract.)

The method of isolating what is called chromatin by the histologist yields compounds of fairly stable composition called nucleins, some of which have been shown to contain iron (Bunge and Zaleski). My observations on hæmatopoiesis in Amphibia led me to the conclusion that the chromatin, from which the hæmoglobin of the hæmatoblasts is derived, is an iron-holding compound. Other observations indicated that the conclusion could, possibly, be made of general application, *i.e.*, that iron is present in the chromatin of every cell, animal and

vegetable. The ordinary method of isolating chromatin employed in chemical and physiological laboratories cannot be readily applied in testing the correctness of this supposition. It is conceivable that this substance absorbs and retains tenaciously iron-holding compounds as readily as it does some of the dyes used by the histologist. It is not easy to remove such compounds without, possibly, decomposing the chromatin, and, when the latter is prepared in any quantity, one cannot be certain that the iron which is present may not be an impurity. To overcome this difficulty, one must prepare chromatin from organs which are free from hæmatin or like substances, or from inorganic iron compounds, and, for this purpose, fairly large quantities would be necessary for chemical manipulation. There is, apparently, no organ, animal or vegetable, which offers such an opportunity. There consequently remains but one other way by which the view, that iron is constantly present in chromatin, can be put to the proof, and that is the micro-chemical one. I have found that a certain method of employing ammonium sulphide as a reagent for iron shows the presence of the latter in the chromatin of the nuclei of a very large number of species of cells hardened in alcohol. The iron in this case does not occur combined as an albuminate, but rather in a condition which, as regards the firmness of the combination, is comparable to that present in potassium ferrocyanide or hæmatin. That the iron found is not due to the presence of hæmatin is shown by the results of experiments made with vegetable cells, and with animal cells which one would not naturally expect to contain hæmatin, as, for example, those of the corneal epithelium in Amphibia. In support of this may also be mentioned the fact that where chromatin is very abundant the iron reaction is very marked, while it is feeble in cells poor in chromatin. In the chromatin loops and filaments of karyokinetic figures the iron reaction is intense and sharply confined to these structures.

I forego, for the present, any expression of opinion as to the general application of the results obtained. I would not even maintain that the chromatin of every cell essentially contains iron, although my studies have, so far, not furnished an instance which can support the contrary view.

The Society adjourned over Ascension Day to Thursday, May 14.

Presents, April 30, 1891.

Transactions.

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Berlin:—Gesellschaft für Erdkunde. Verhandlungen. Bd. XVIII. No. 7. 8vo. *Berlin* 1891. The Society.